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PRE-APPEAL BRIEF REQUEST FOR REVIEW

Docket Number (Optional)

FIS920030193U51
(16928)

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on October 11, 2005

Signature

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name

MARVIN BRESSLER

Application Number

10/718,381

Filed

11/20/2003

First Named Inventor

HERVE Y. KERMEL

Art Unit

2812

Examiner

Walter Lindsay, Jr.

Applicant requests review of the final rejection in the above-identified application. No amendments are being filed with this request.

This request is being filed with a notice of appeal.

The review is requested for the reason(s) stated on the attached sheet(s).

Note: No more than five (5) pages may be provided.

I am the

☐

applicant/inventor.

☐assignee of record of the entire interest.
See 37 CFR 3.71. Statement under 37 CFR 3.73(b) is enclosed.
(Form PTO/SB/96)☐attorney or agent of record.
Registration number _____☒

attorney or agent acting under 37 CFR 1.34.

Registration number if acting under 37 CFR 1.34 25,132

Signature

Marvin Bressler

Typed or printed name

(516) 742-4343

Telephone number

October 11, 2005

Date

NOTE: Signatures of all the inventors or assignees of record of the entire interest or their representative(s) are required. Submit multiple forms if more than one signature is required, see below.

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*Total of _____ forms are submitted.

This collection of information is required by 35 U.S.C. 132. The information is required to obtain or retain a benefit by the public which is to file (and by the USPTO to process) an application. Confidentiality is governed by 35 U.S.C. 122 and 37 CFR 1.11, 1.14 and 41.6. This collection is estimated to take 12 minutes to complete, including gathering, preparing, and submitting the completed application form to the USPTO. Time will vary depending upon the individual case. Any comments on the amount of time you require to complete this form and/or suggestions for reducing this burden, should be sent to the Chief Information Officer, U.S. Patent and Trademark Office, U.S. Department of Commerce, P.O. Box 1450, Alexandria, VA 22313-1450. DO NOT SEND FEES OR COMPLETED FORMS TO THIS ADDRESS. SEND TO: Mail Stop AF, Commissioner for Patents, P.O. Box 1450, Alexandria, VA 22313-1450.

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IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

Applicant: Herve Y. Kermel et al.

Examiner: Walter L. Lindsay, Jr.

Serial No: 10/718,381

Art Unit: 2812

Filed: November 20, 2003

Docket: FIS920030193US1 (16928)

For: CLEAN CHEMISTRY FOR TUNGSTEN/
TUNGSTEN NITRIDE GATES

Dated: October 11, 2005

Confirmation No. 9525

Mail Stop AF
Commissioner for Patents
P. O. Box 1450
Alexandria, VA 22313-1450

REASONS FOR PRE-APPEAL BRIEF REQUEST FOR REVIEW

Sir:


Applicants request review of the final rejection of Claims 1 and 4-9, as being unpatentable, under 35 U.S.C. § 103(a), over Derwent-ACC-No. 2002-178025 to Kim et al. taken in view of US Patent 6,290,859 to Fleming et al.

As succinctly put in the Advisory Action dated September 19, 2005, the final rejection is predicated upon the principal Kim et al reference teaching of a cleaning composition comprising sulfuric acid and hydrogen peroxide for cleaning a tungsten gate conductor.

CERTIFICATE OF MAILING UNDER 37 C.F.R. §1.8(a)

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Dated: October 11, 2005


Marvin Bressler

The Advisory Action further states that the secondary Fleming et al. reference teaches a composition of sulfuric acid and hydrogen peroxide present in a ratio in a range of 5:1 to 10:1 employed in cleaning a semiconductor material. The combination of Kim et al. and Fleming et al., the Advisory Action continues, shows the claimed invention since the Fleming et al. composition cleans a semiconductor material. The Advisory Action states that Kim et al. shows a similar process to that set forth in Claim 1. Thus, the Fleming et al. teaching of the combination of compounds set forth in Claim 1 would be found without undue experimentation with respect to Kim et al.

The Kim et al. disclosure is an English language abstract which teaches a process of manufacturing a gate electrode of a semiconductor device in which tungsten is prevented from being corroded after the gate electrode is patterned and to effectively eliminate remaining polymer and photoresist by using a revised sulfuric acid-peroxide mixture, in which the ratio of sulfuric acid to hydrogen peroxide is from 30:1 to 100:1, in a process for cleaning the gate electrode.

Even assuming that this brief disclosure teaches a process of cleaning a semiconductor device which includes a tungsten gate conductor, the application of the secondary Fleming et al. reference represents an admission that the Kim et al. disclosure does not make obvious the claims of the present application. The teaching of the secondary Fleming et al. reference, wherein the claimed ratio of sulfuric acid to hydrogen peroxide is overlapped, is thus critical to the issue of patentability, under 35 U.S.C. § 103(a), of Claims 1 and 4 to 9 of the present application.

The secondary Fleming et al. reference is applied, as stated above, for its disclosure of a cleaning solution which comprises a mixture of sulfuric acid and hydrogen

peroxide. That cleaning solution is disclosed in Fleming et al. at Column 8, line 49 to Column 9, line 10. Therein a cleaning solution of hydrogen peroxide and sulfuric acid, in a sulfuric acid to hydrogen peroxide ratio of 5:1 to 10:1, is disclosed. That disclosure sets forth the immersion of a semiconductor substrate for 0.5 to 10 minutes, preferably 5 minutes, at a temperature in the range of 60-130 °C.

On the face of it such a disclosure, when combined with Kim et al., would indeed make obvious the claims of the present application, assuming that the recited ratio range was a volume ratio, which is unstated. However, this is not the applied teaching of the two combined references. Although Fleming et al. teaches a cleaning solution within the range of that claimed in the present application, that cleaning solution is not applied to a semiconductor device which includes a tungsten gate conductor.

Attention is directed to Fleming et al. at Column 10, lines 24-33. That portion of Fleming et al. clearly recites that the step of providing a tungsten coating, and thus forming a device that arguably reads on tungsten gate conductor, occurs subsequent to the cleaning step. As such, no processing steps of the type set forth in Claims 1 and 4-9, and presumably disclosed in Kim et al., is taught by Fleming et al. Fleming et al. discloses the use of a cleaning solution within the scope of that claimed in the present application in the cleaning of a semiconductor prior to formation of the tungsten gate conductor.

Applicants do not allege that a cleaning solution which includes sulfuric acid and hydrogen peroxide in the volumetric ratio range claimed is in and of itself novel. The patentable advance of the finally rejected claims is the cleaning of a CMOS device which includes a tungsten gate conductor without significant tungsten removal. Until the invention of the present application adequate cleaning of a CMOS device containing a tungsten gate conductor could not

be obtained without excessive tungsten removal, resulting in unacceptable electrical conductivity reduction.

That the final rejection relies on a composition employed in an application which would not suggest its use in the claimed process emphasizes that the final rejection is nothing more than the assemblage of two references to meet the template provided by the claims of the present application. That is, the applied references provide no motivation for their combination. It is the merest of coincidences that the Fleming et al. cleaning solution provides the unexpected positive result of removing carbon-containing and etch residues without also removing tungsten from a CMOS device which includes a tungsten gate conductor.

That the Fleming et al. patent, although directed to the formation of a tungsten coating on a semiconductor surface, makes no mention of the relied upon sulfuric acid-hydrogen peroxide composition in treating the tungsten-containing semiconductor emphasizes that those skilled in the art would not be motivated to use that cleaning composition, used in the cleaning of semiconductor substrates free of tungsten, in a manner suggesting the process of Claims 1 and 4 to 9 of the subject application.

Respectfully submitted,



Marvin Bressler
Registration No. 25,132
Attorney for Applicant

SCULLY, SCOTT, MURPHY & PRESSER
400 Garden City Plaza, Suite 300
Garden City, New York 11530
(516) 742-4343
MB:rd/gc